

# EXHIBIT A

## Miscellaneous Mechanical Uniques

- 1 35mm fans (3wire) 3
- 2 Blower 1
- 3 Liteon Power Supply 1
- 4 Proc Heatsinks 2
- 5 Optrex LCD Module 1
- 6
- 7
- 8
- 9

## Cables

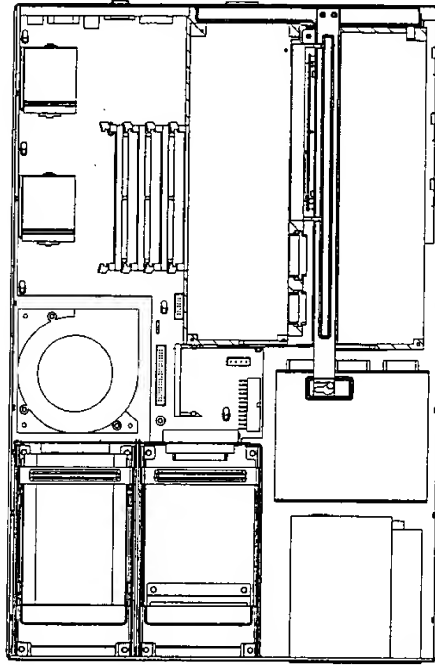
- 1 Power Cable 1
- 2 100pin power/signal cable 1
- 3 LCD Module Ribbon cable 1
- 4
- 5
- 6

## Screws

- 1
- 2
- 3
- 4
- 5
- 6
- 7

## Hot Plug DRV Backplane

- 1
- 2
- 3
- 4



## Motherboard PCA

- 1 225427-002 universal serial bus 1
- 2 109308-008 sub-d/female, right angle 1
- 3 148037-002 dual, right angle, 8pos, minidin 1
- 4 109069-001 sub-d, male, right angle 1
- 5 AMP-1116353 inverted mod jack 1
- 6 148065-001 green LED diode 1
- 7 295566-001 scsi receptacle, high density 1
- 8 AMP-97-1795-505 25° angle DIMM conn 4
- 9 Molex 71661 EBB1 50D Plug right angle 60pos 1
- 10 Molex 71661 EBB1 50D Plug right angle 40pos 1
- 11 102535-004 vert, shrouded, PCB, .084 diam 1
- 12 Molex 5569minifit, JR header Rangle, dual row 1
- 13 Molex 71661 EBBU 50D Plug vert 100 pos 1
- 14 314029-001 ROC socket 1
- 15 107114-015 low profile shrouded header 1
- 16 100186-031 PCB straight header 1
- 17 107114-035 low profile shrouded header 1
- 18 Intel PGA370S Socket 2

## PCI Backplane PCA

- 1 269218-003 PCI card edge .050 centers ex 1
- 2 148062-001 PCI card edge .050 centers 1
- 3 270606-001 242P card edge KLA 1

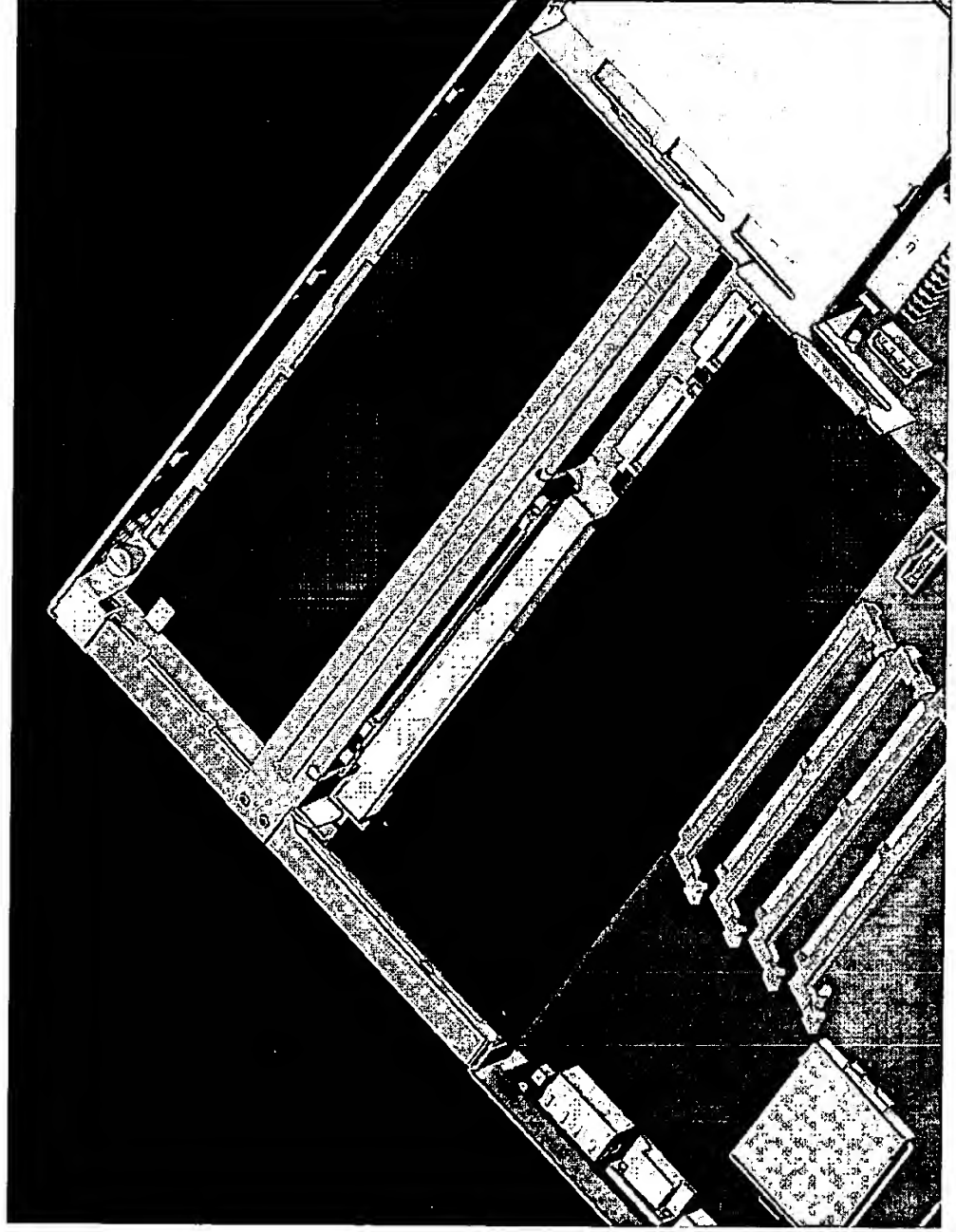
## Removable Media Backplane PCA

- 1
- 2
- 3
- 4
- 5

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## EXHIBIT B

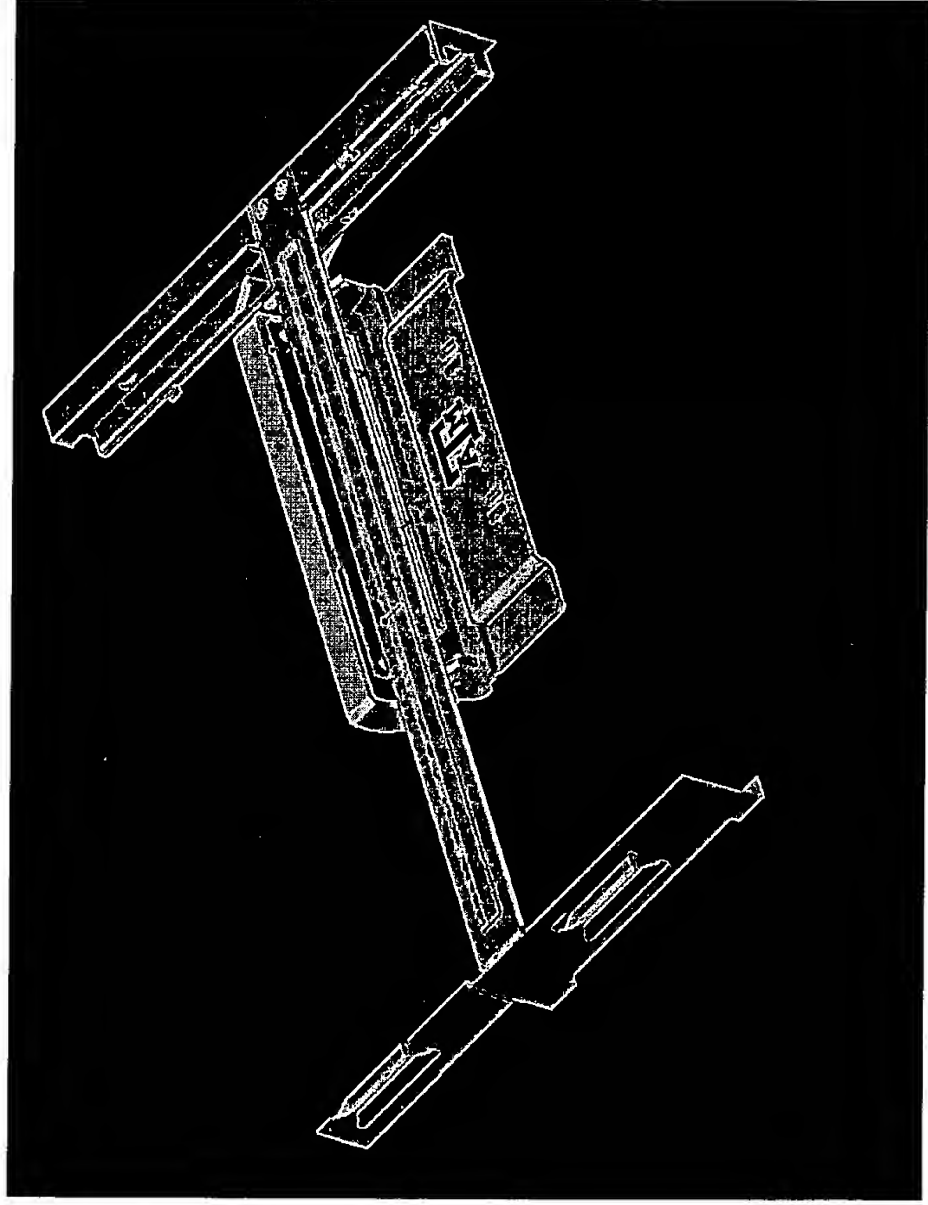
# PCI Riser Card Assembly



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# EXHIBIT B

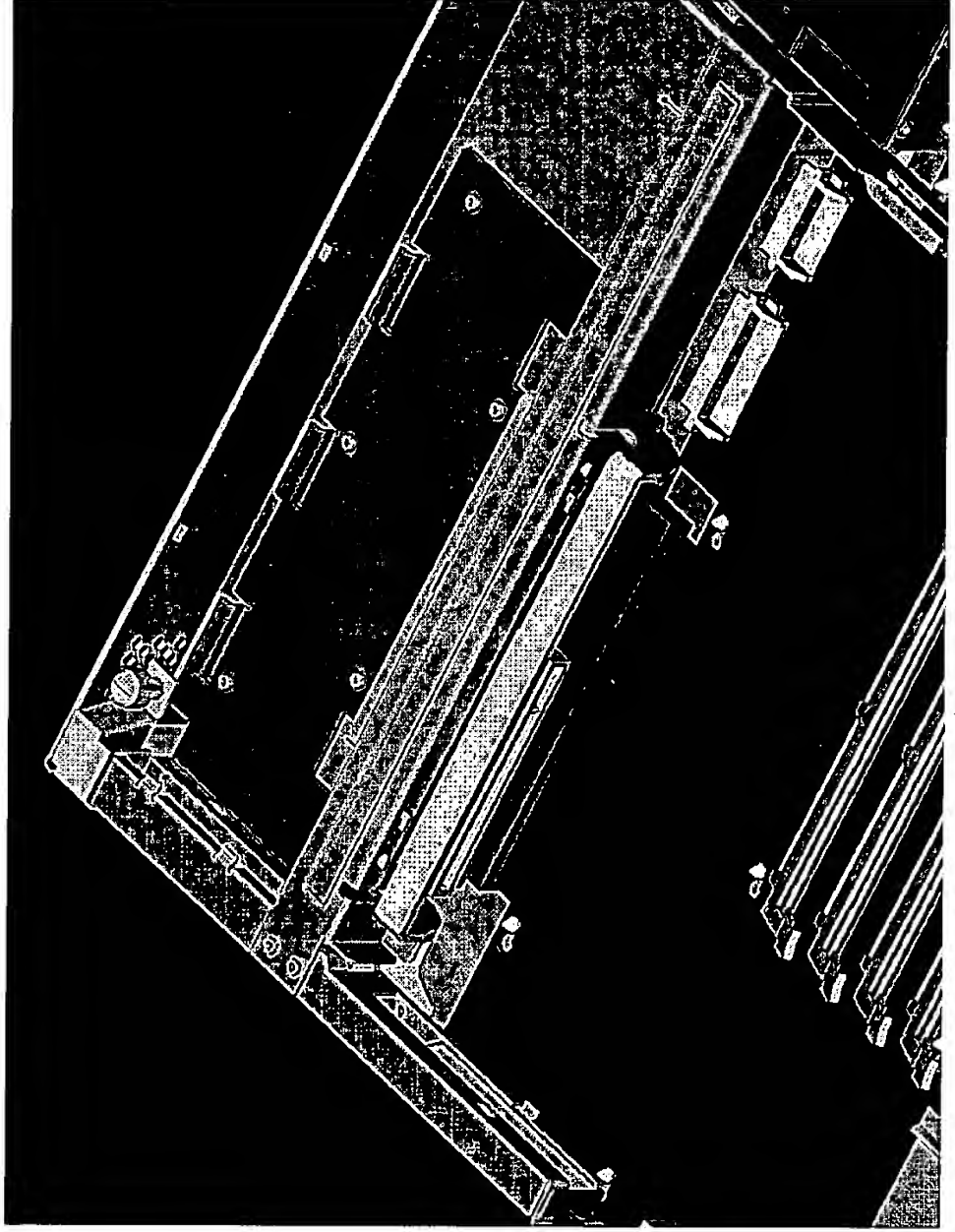
## PCI Bracket (Removed, No Cards)



## EXHIBIT B

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# No PCI Cards Installed



# EXHIBIT C

## ***Micro Machines*** **Mechanical Plan of Record**

### **Introduction**

The mechanical development for *Micro Machines* will be a co-development lead by the ESSG Mechanical Development Team at Compaq. David Bologna's team will execute the program for Bob Hastings, the Corporate and Appliance Mechanical Manager. Inventec, Taipei will assist in the mechanical development and Foxconn, China will be the sheet metal and plastic tooling vendor.

### **General Description of Requirements**

The first application for *Micro Machines* is as a corporate server. The hardware design will then be leveraged for the Appliance market space. This product is a 1U (1.75", less rack clearances), 2P, 2 slot, 2 disk drive server. The unit will ship standard as a fixed rack mount, but support optional ball bearing rails. The unit will also be supported in 3<sup>rd</sup> party, variable depth racks and Telco racks. It will be stackable and readily support a high availability cluster solution.

### **Mechanical Deliverables**

Prior to the first revenueable build, the mechanical team will deliver a value-add (VA) chassis assembly, whose parts and subassemblies are validated for production. The VA chassis will meet Compaq's design, tooling, and procurement approval requirements as they apply to Alliance partner programs. In addition, the chassis will meet all Compaq clear to ship mechanical testing requirements; thermals, shock and vibe, etc.

#### Mechanical Features List:

The chassis is 1U rack-mountable. No tower model will be developed. The key mechanical features will include,

- Front access hot pluggable drives (with internal, fix mounted drives as an option)
- Front access thin floppy and CD
- Front access power switch
- Front viewable status LEDs
- Rear access to external IO connectors and PCI (2) IO connectors
- Removable top cover
- 15 minute field serviceability (when mounted on ball bearing slide rails)
  - Easily removable, toolless PCI bracket assembly
  - Easily removable, toolless fan/baffle assembly
  - Easily removable, toolless power supply
  - Easily removable, toolless backplanes
  - Easily removable, toolless system board

#### Optional Mechanical Features List:

There are plans for the chassis to mechanically support the following options, when the program team decides to support these features electrically,

- Front panel LCD that rests in front of the floppy/CD and retracts when these devices are in use
- Front and rear access 'toggle light switch' for easy identification of the unit in a dense rack
- Front access USB (1) and/or IR (1)

#### New PCAs:

The mechanical deliverables include the mechanical board outlines for the following 5 PCAs.

- Mother (system I/O) board
- PCI riser board
- SCSI backplane board
- FDD/CD backplane board
- Power switch/LED board

#### Special Mechanical Considerations:

- All sharp edges will be identified and corrected early – coined or hemmed.
- All customer interface areas (panels, mechanisms, etc.) will be 'friendly'.
- Early DFX activities will take place (Reliability, Service, Manufacturing, etc.).
- Mechanical pier reviews will be held.

## **Mechanical Evaluation and Test Plan**

The following mechanical testing and mechanical evaluations will take place. Some of this work may be done at Inventec and validated by Compaq.

- Thermals
- Shock and Vibe
- HALT/HASA
- FCC
- Acoustics
- Fit/function and mitigation of sharp edges

## **Mechanical Risks**

#### Thermals:

The primary areas of concern are exhausting the air over the processors, pulling enough volume to cool 15K rpm drives, and reducing areas of high recirculation. The problems are exaggerated in a fully loaded rack at 35 degC ambient temperature. Until thermal testing commences with Proto 1 boards in early October, preventive actions include; early airflow testing/modeling, implementation of a 24V blower and necessary baffles, and maximum ventilation at the rear of the chassis. Some contingency plans include; adding processor, heatsink fans for extra cooling, turning the blower upside down to better direct air over processors, and adding parts necessary to baffle and channel the airflow.

#### Rack Management:

Fixed mount and slide rail cable management and installation require a lot of work, closely tied with the rack option team in SPD. Issues include a high number of necessary rack mount hardware, KVM switches, and PDUs, proper unit to unit registration, thermals, and rack CTO. Preventive actions involve early design engagement with the rack option team and early testing of fully configured racks, as soon as units are available in early October.

#### Structural Support:

A pizza box form factor is susceptible to twisting and bending and will be prone to damage during package and accelerated life cycle testing. All efforts are in place to rigidly reinforce the main structural members, despite the density of internal components and large area of ventilation required. Shock and vibe and HALT/HASA testing will commence as soon as Proto 1 units are available in October.

## **Mechanical Schedule**

<u>Milestone</u>	<u>Working Date</u>	<u>High Confidence Date</u>
Mech. Proto 1	9/7	9/21
Mech. Proto 2	10/12	11/2
Pilot 1	11/16	12/21
Hard Tool Start	10/20	11/24
Pilot 2 (Hard Tool)	1/25	3/21
Chassis 3b (Foxconn)	2/2	3/28
VA Chassis 3b (Inventec)	2/23	4/25
MVB	3/8	5/9

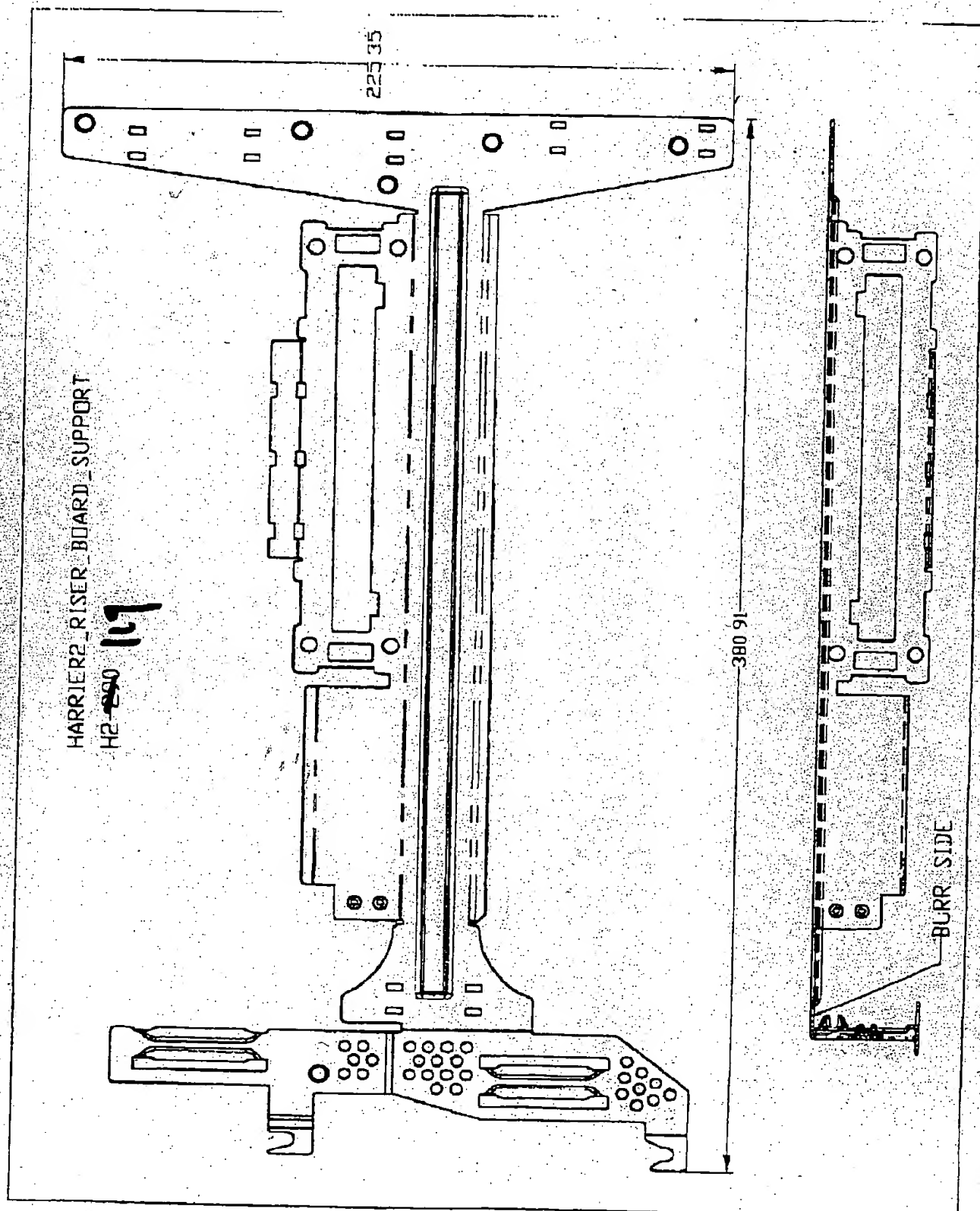
## Mechanical Documentation

Mechanical development guidelines will be followed to ensure the program runs smoothly, efficiently, and on schedule. The documentation and part/assembly approval process will be a joint effort between Compaq, Inventec, and Foxconn. Some parts and assemblies will be documented in the Compaq system. These are normally at the level of purchased and/or spared assemblies. Inventec will document parts and assemblies below this level on the BOM. A complete list of who documents what will be generated as the project progresses. All tooling verification reports will be prepared by Foxconn and be the responsibility of Inventec to approve under Compaq oversight.

- Documentation of Compaq released parts and assemblies will be tracked as follows:
  - X - Conceptual development, design, and evaluation
  - E - Engineering release to tooling
  - AX - Documentation release
  - A - Design release to production
- The product development process (PDP) checklist will be followed to ensure completion of all critical tasks in each of the development phases.
- A mechanical schedule (working and high confidence) and BOM, upto the VA chassis (and option kit) level, will be maintained.

David Bologna, 9/1/99

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HARRIER2\_RISER\_BOARD\_SUPPORT

H2-290

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EXHIBIT D